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FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES

FIT PROJECT

TDD # F1-8005-01F

December 5, 1980

TASK REPORT TO THE ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. 68-01-6056

Superfund Records Center

SITE: 0115BREAK: 43OTHER: 476282

SITE INSPECTION REPORT
of
OLIN CHEMICALS GROUP PLANT

Eames Street
Wilmington, Massachusetts

Submitted to:
John Hackler, Chief
Office of Uncontrolled Waste Sites
U.S. EPA, Region I

Submitted by:
David Cook, Project Leader
Ecology and Environment, Inc. (E & E)
FIT Team, Region I

ecology and environment, inc.

International Specialists in the Environmental Sciences

SITE INSPECTION REPORT

FOR

OLIN CHEMICAL GROUP
WILMINGTON PLANT

TDD #: F1-8005-01F

Firm Name: Olin Chemicals Group

Address: Eames Street
Wilmington, Massachusetts

Telephone: 203-356-3156

Owner: Corporation

Principal Contact at Site: Mr. David Vaughn
(Hartford Office)

1. Purpose of Inspection:

To gather information and samples necessary to determine the potential for possible RCRA and/or 311/104 Clean Water Act actions against Olin Chemical Group.

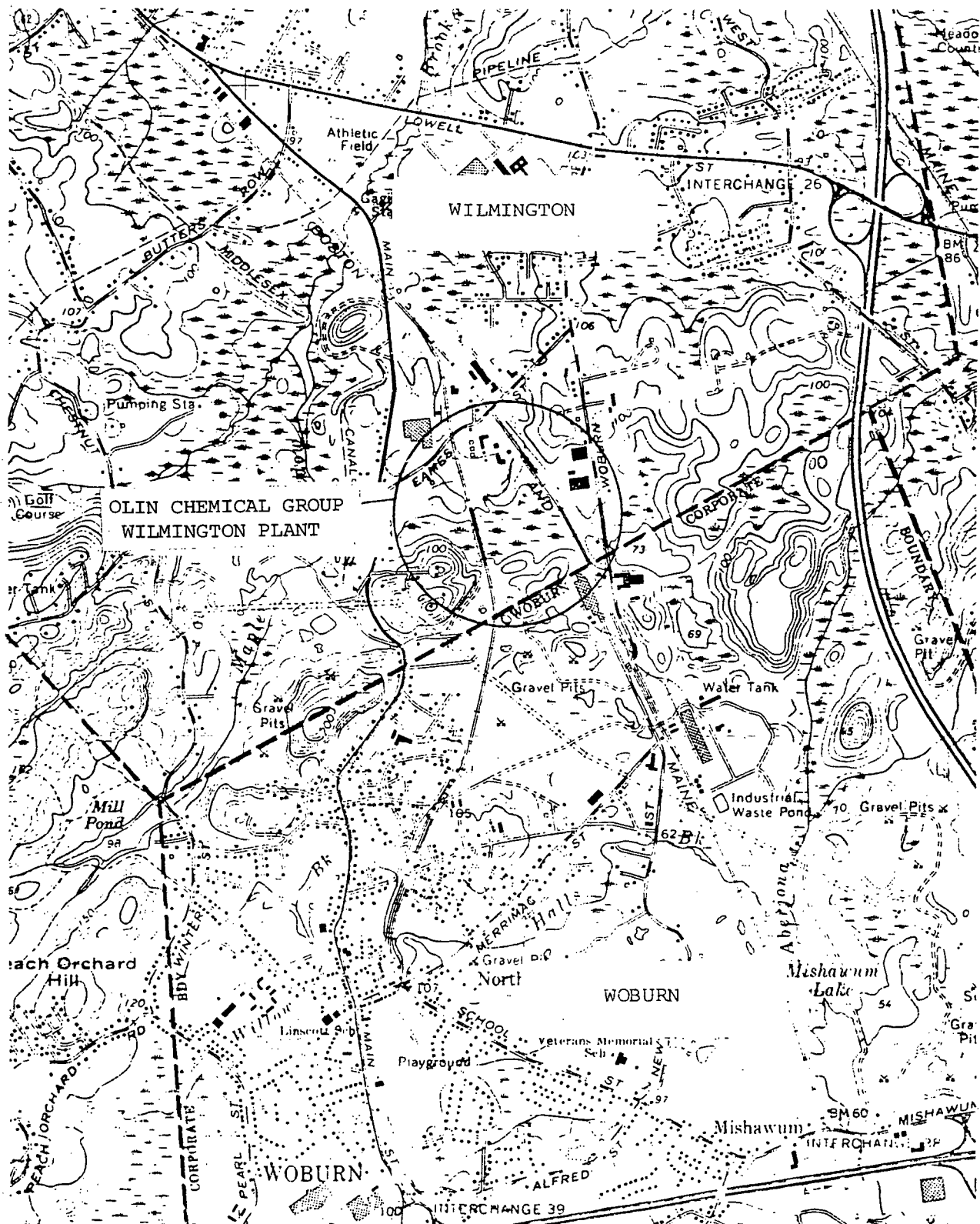
2. Objective:

To conduct an on-site investigation of the Wilmington Plant site in order to locate evidence of contamination, identify possible contaminants and collect appropriate samples for screening and analysis.

3. Background:

3.1 Description:

The Olin Chemicals Group Wilmington Plant occupies a 53-acre site south of Eames Street in Wilmington, Massachusetts. The site is bounded on the east by the Boston and Maine railroad tracks, on the south by the Woburn-Wilmington town line, on the west by a Boston and Maine railroad spur, and on the north by Eames Street (See Figures 1 and 2). The property was purchased by Olin Chemicals Group in September, 1980 from the Stepan Chemical Company which had occupied the site since 1971. Chemical plant operations on this site began in 1953 under the ownership of National Polychemicals, Inc. which merged with Stepan Chemical Company in 1971. The northern one-half of the site is occupied by the production facilities, and the southern one-half is wooded. A drainage ditch parallel to the Boston and Maine tracks borders the eastern project site boundary and carries water from north to south. This drainage ditch continues adjacent to the tracks until its confluence with Hall's Brook about 0.9 miles south of the site. Nearly all surface water on the site is routed to a single channel which flows into the drainage ditch, as shown in Figure 2.



From USGS Quadrangle Map - Wilmington Quadrangle.

Scale: 1" = 2000'

Figure 1 - Location Map of
Olin Chemicals Group
Wilmington Plant.

3. Background:

3.1 Description -continued

At the time when the aerial photograph presented in Figure 3 was taken (April 24, 1971), three acid pits existed to the south of the processing facilities. These pits have been replaced by rectangular settling basins as shown in Figure 4 (photographed on April 29, 1977). An extensive area of distressed vegetation is present in the east-central portion of the property. Also on the property are eleven large storage tanks noted in Figure 4. there are twelve wells on the property as noted in Figure 2.

3.2 Primary Site Activity:

Several chemicals have been synthesized on-site from a variety of ingredients. The processes used and the final products are as follows (quantities based on 1973 production figures):

- | | |
|-----------------------|--|
| Opex Process - | Dinitropentamethylenetetramine (DNPT), a slightly water soluble solid used as a blowing agent in the production of expanded rubber compounds, 1.2 million pounds per year. |
| Kempore Process - | Azodicarbonamide (Kempore), also a slightly water soluble solid used as a rubber blowing agent, 1.6 to 1.8 million pounds per year. |
| Wytox Process - | Wytox, a liquid phosphite rubber stabilizer, one million pounds per year. |
| Wytox ADP-X Process - | Diocetyldiphenylamine (DODPA), a dark colored resinous solid, 600,000 pounds per year. |
| O.B.S.H. Process - | Oxybisbenzenesulfonylhydrazide (OBSh), a rubber blowing agent, 300,000 pounds per year. |

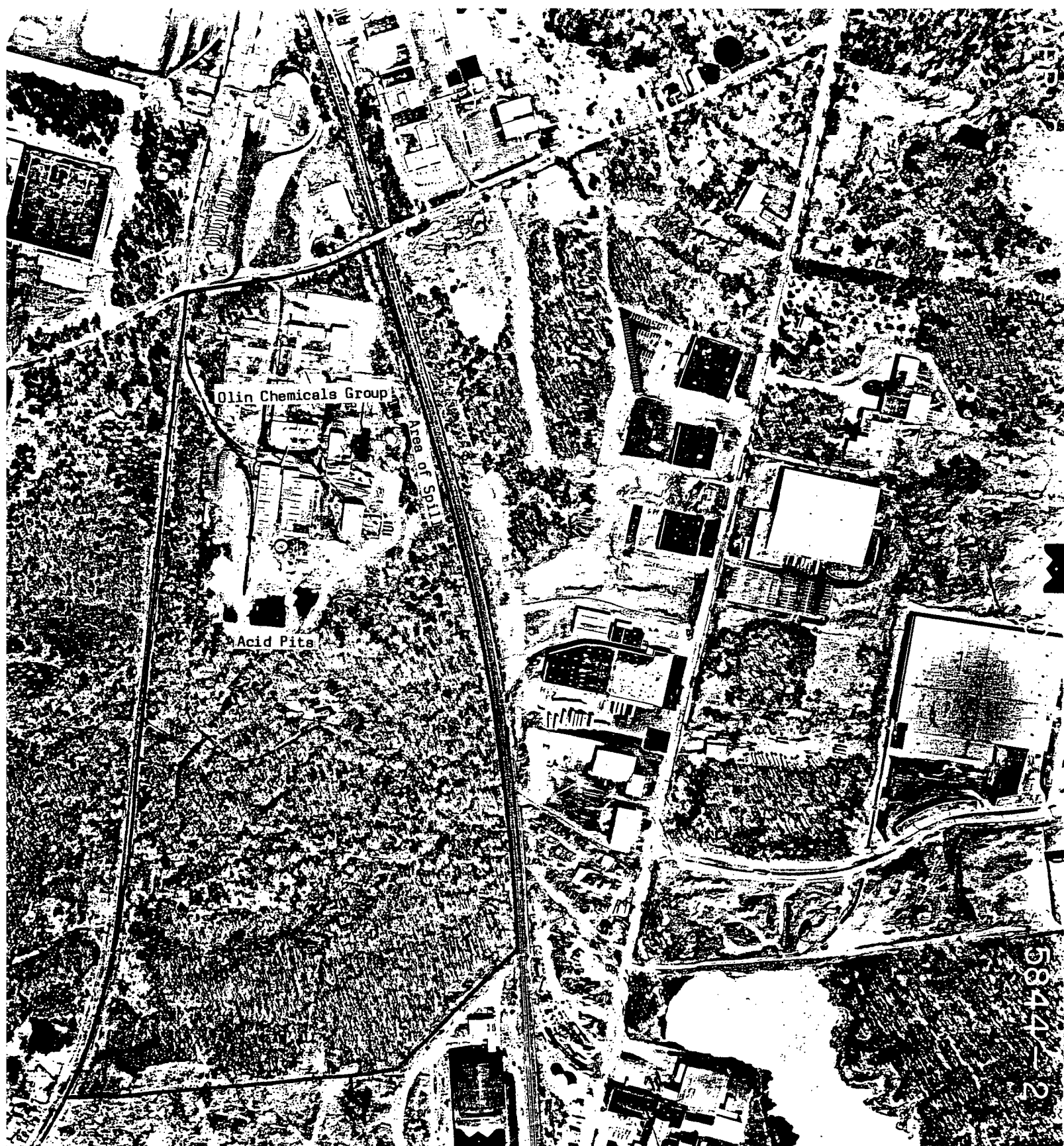
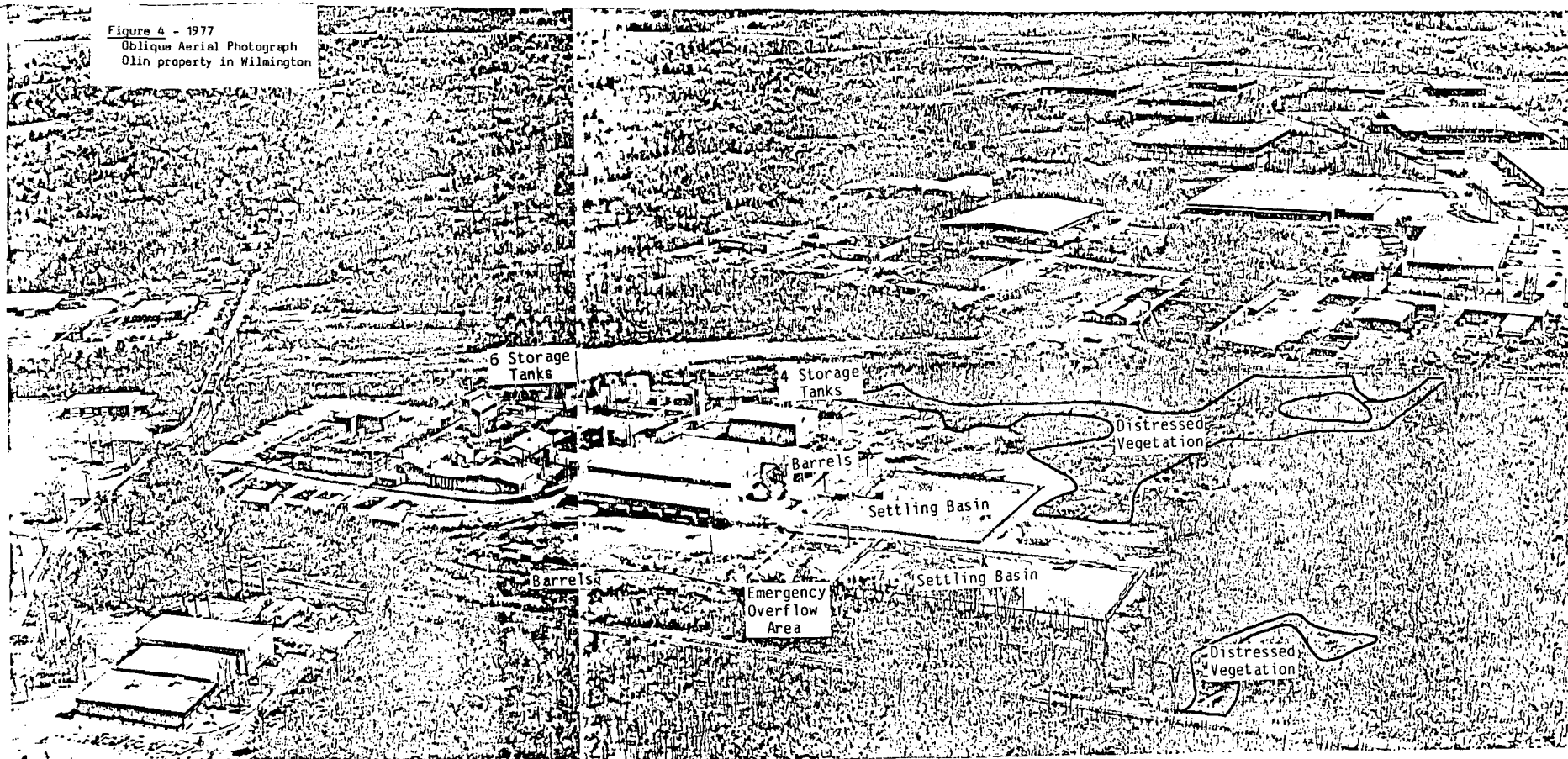


Figure 3 - April 24, 1971
Aerial Photograph Showing
the Location of the Former
Acid Pits.

Figure 4 - 1977
Oblique Aerial Photograph
Olin property in Wilmington



3. Background:

3.2 Primary Site Activity - continued

Raw materials and waste products for the preceding processes are listed in Table 1. Only those waste products discharged into the yard or floor drainage system are listed. The drainage system is shown in Figure 5.

In addition to the above processes, numerous coatings for rubber products were produced on site. The following chemicals were used to produce the coatings:

- Bentone
- Santocel
- Ufamite MM 67
- Toluene
- Butylacetate
- Acrylic Resins
- Maleic Anhydride
- Glycerine
- Fatty Amines
- Silicone
- Monoethanolamine
- Mineral Oil

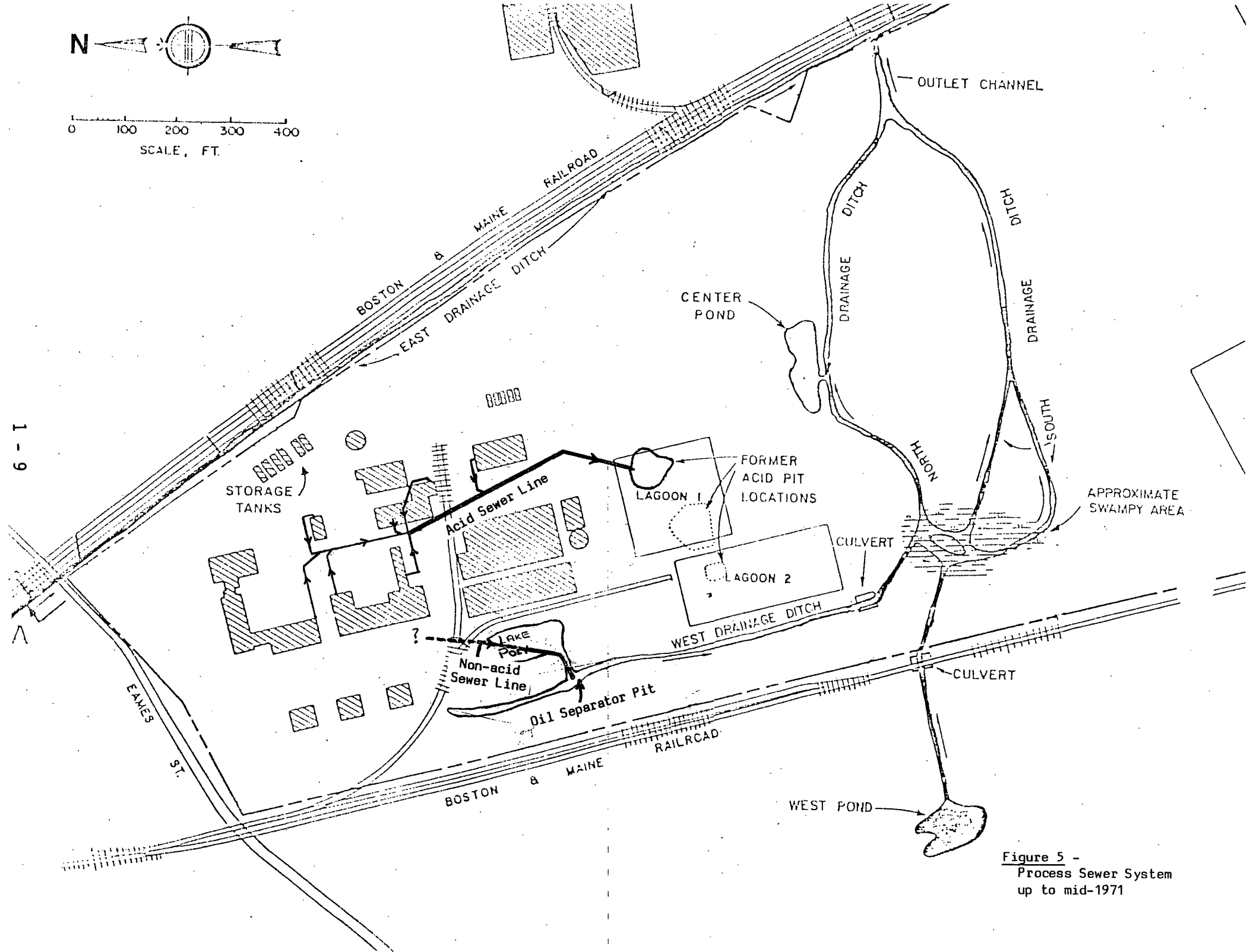
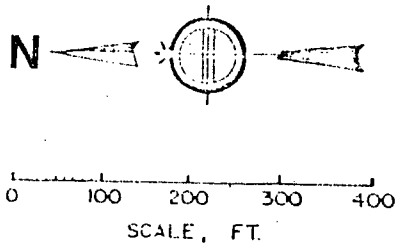


Figure 5 -
Process Sewer System
up to mid-1971

3. Background:

3.2 Primary Site Activity - continued

TABLE 1 - Raw Materials and Waste Products Associated With Chemical Processes Used by National Polychemicals, Inc. and Stepan Chemical Company between 1953 and 1978.

<u>Process</u>	<u>Raw Materials</u>	<u>Waste Products</u>
Opex	anhydrous ammonia formaldehyde sodium nitrite hydrochloric acid	sodium chloride formaldehyde sodium nitrite process oil
Kempore	liquid chlorine urea sodium hydroxide sulfuric acid hydrazine	sodium sulfate sodium chloride ammonium sulfate urea sulfuric acid
Wytox	phosphorous trichloride paraformaldehyde nonyl phenol	None sewerd
Wytox ADP-X	diphenylamine diisobutylene aluminum chloride	diisobutylene aluminum hydroxide sodium chloride
O.B.S.H.	diphenyloxide chlorosulfonic acid	sulfuric acid

3. Background:

3.2 Primary Site Activity - continued

According to MDC records, the following materials were being stored on-site as of June 30, 1980:

<u>MATERIAL BEING STORED:</u>	Annual Thruput (gals.)	Type of Storage Container (tank, drum, etc.)	Size of Container (gals.)
1. Formaldehyde	172,500	Tank	13,300
2. Nonyl phenol	281,600	Tank	10,000
3. Dinonyl phenol	30,500	Tank	6,700
4. Ethyl hexoic acid	18,400	Tank	5,000
5. Dioctylphthlate	54,200	Tank	15,000
6. Process Oil	11,800	Tank	4,250
7. TNPP (Wytox 312)	50,000	Tank	10,000

Chemicals used or manufactured at this site are transported in 55-gallon drums by railcar.

3.3 Secondary site activity:

Not applicable

3. Background:

3.4 Hazards Identified or Alleged:

Potential sources of contamination as a result of on-site activities past or present are the following:

1. Leaking of materials from storage tanks.
2. Leaching of materials from acid pits.
3. Leaching of materials from burial sites.
4. Exfiltration from sewers.

A close examination of the chemicals which have been used on-site indicates that only a small number may have contributed or are contributing to an environmental hazard. Toluene and dioctylphthalate are included in the Federal Register list of priority pollutants. It is highly likely that toluene would have volatilized soon after a spill. Dioctylphthalate is very persistent and has been associated with pneumonia-like symptoms. Several other chemicals used on site including hydrazine, nonylphenol, dinonylphenol, and ethyl hexoic acid may cause undesirable symptoms. The extensive vegetative stress noted on-site is probably the result of high sodium chloride and sulfuric acid concentrations leaching from the former acid pits.

Prior to 1971, all waste materials were disposed of on-site either into a series of three acid pits or directly into a series of channels on the property. Eventually, all material either leached or drained into the ditch paralleling the Boston and Maine railroad tracks and proceeded ultimately to the Aberjona River. In 1971, disposal of wastes was changed to the system presently in use. Sulfate bearing wastes are mixed with a calcium hydroxide slurry to form a calcium sulfate sludge which is disposed of in two polyvinyl chloride (PVC)-lined lagoons. An analysis of this sludge is as follows (analyzed by National Polychemicals, Inc., September 1970):

3. Background:

3.4 Hazards Identified or Alleged - continued

Water	27,500 lbs.
Gypsum	26,800 lbs.
CaCO ₃	650 lbs.
Calcium Oxbisbenzene Sulfonate	Trace
Na ₂ SO ₄	Trace
Al (OH) ₃	Trace
NaCl	Trace
CaCl ₂	Trace
Formaldehyde	Trace
NaNO ₂	Trace
NH ₄ Cl	<u>Trace</u>
 TOTAL	 54,950 lbs. = 27.5 Tons/Day

A study performed in 1979 by Geotechnical Engineers, Inc. of Winchester, Massachusetts, indicated that several holes exist in the PVC liner (See Figures 6 to 8). It was also discovered that sludge has been dumped in an emergency lagoon when the two existing lagoons filled to capacity (See Figure 4). This emergency lagoon had no liner and was formed by dredging soil to form a roughly rectangular area. Solids from the lagoons are dredged periodically and landfilled on the southwest corner of the property. The landfill site was approved by the State Department of Environmental Quality Engineering (DEQE). The analysis of the sludge indicates that no environmental hazards would result from leaching of the lagooned or landfilled materials into the ground.

Non-sulfate bearing wastes generated on-site are presently discharged into an underground sewer line which connects to a Town of Wilmington owned sewer. This line connects to a Metropolitan District Commission (MDC) sewer line. Complaints regarding high chloride, sulfate and ammonia levels in the sewer effluent have been made on several occasions.



Figure 6 - Leak Along the Seam
of the Polyvinyl Chloride Liner
in the Sulfate Sludge Lagoon.



Figure 7 - Enlargement
from Figure 6.



Figure 8 - Hole in the Polyvinyl
Chloride Liner Associated with
the Sulfate Sludge Lagoon.

3. Background:

3.4 Hazards Identified or Alleged - continued

An unofficial report from a former Stepan employee indicates that phosphorus trichloride was often dumped directly into the ground and that residues were buried next to the wetlands near the drainage channel. Sediment and ground water samples were taken in an attempt to confirm or deny the existence of an environmental hazard resulting from such alleged activities.

A 1977 aerial photograph shows two areas where drums were stored on-site (See Figure 4). Leaks in these drums may have resulted in ground water contamination. The 1971 photo (Figure 3) also reveals a spill generating from the group of six large storage tanks on the east side of the property. Since 1973, "black ooze" has been noted seeping into the drainage ditch paralleling the railroad tracks east of the site (Figure 9). A sample was taken by the E & E, FIT team on October 2, 1980, (See memo to John Hackler from David Cook dated October 6, 1980). A conversation between D. Cook (E & E) and D. Vaughn (Olin) revealed that dioctylphthalate, dimethylamine, dioctylamine and other related compounds are present in the "black ooze" as well as in Well GW-2 (See Figure 2). This was determined by an analysis performed by Olin. Mr. Vaughn was very hesitant to have Well GW-2 sampled. He stated that he knew the well was contaminated and Olin was prepared to perform remedial actions of an undisclosed nature to rectify the situation.

The drainage ditch mentioned above has been the object of sampling and analysis on several occasions. On January 23, 1980, five samples were collected by the EPA and subsequently analyzed for purgeable organics. The results indicated the following:

1. Moderate to high levels of 1,1 - dichloroethane, 1,1,1 - trichloroethane, trichloroethylene, toluene and xylene are present upstream of Stepan/Olin.



Figure 9 - Sheen resulting from
"black ooze" seeping into the
Drainage Ditch.

3. Background:

3.4 Hazards Identified or Alleged - continued

2. Moderate to high levels of 1,1,2 - dichloroethylene and 1,1,2 - trichloroethane in addition to the five chemicals listed under (1) are present downstream of Stepan/Olin.
3. Therefore, some chlorinated hydrocarbons may be leaching from Stepan/Olin into the drainage ditch.
4. Analyses of the outfalls from Stepan/Olin do not indicate significant off-site migration of contamination.

Priority pollutant samples were taken from the drainage ditch paralleling the railroad tracks on July 28, 1980. Analyses of samples taken upstream and downstream of the Stepan/Olin property suggested that small amounts of the priority pollutants listed in Table 2 are generating from the site.

The primary purpose of this site inspection was to gather appropriate samples for analysis to determine if any ground or surface water contamination is generating from Olin property. The sampling plan is presented in Section 4, and the sampling procedures and screening results are included in Section 7.2 of this report. The preliminary results indicate that, with the exception of the "black ooze" and significant amounts of residual heavy hydrocarbons noted in Section 7.2, no significant sources of contamination are present on site. Evidence of buried drums was noted just west of the headwall (See Figure 2). However soil, surface water and groundwater revealed no evidence of hazardous chemicals generating from the burial site.

4. Concept of Operation:

A seven-person team entered this site to identify the nature of materials stored on site, investigate possible sources of contamination and collect appropriate samples for screening and analysis.

Table 2:

Priority Pollutants Suggested To Be Entering the East Drainage Ditch from Olin Property
(Based on July 28, 1980 Priority Pollutant analyses)

<u>CONTAMINANT</u>	<u>METHOD OF CONTACT</u>	<u>HEALTH EFFECTS</u>
<u>Trichloroethylene</u>	Inhalation: Chronic Inhalation: Inhalation of large quantities: Ingestion:	Headache, nausea, drowsiness Possibly liver damage. (This has <u>not</u> been documented in Humans). May cause narcosis Possibly liver damage. (This has <u>not</u> been documented in humans).
Note: TCE is an experimental animal carcinogen. (rats). 1979 recommended ambient water quality criterion 2ug/l Based on tumors in rats and not on human health affects.		
<u>N-Nitrosodiphenylamine</u>	Ingestion only Toxicity:	Not an inhalation hazard. This compound belongs to the class of nitrosamines.
Note: Nitrosamines are suspected human carcinogens. There are no human data, but nitrosamines do cause tumors of the stomach, lung, liver, bladder and kidney in rats. The class criterion is 0.1/ug/l water (ambient water) based on tumor formation in rats.		
<u>Bis (2-Ethyl hexyl) phthalate</u>		
Note: Phthalates are non-biodegradable and potential aquatic hazards. They have no documented human health effects that may be associated with environmental hazards. Phthalates are used as plasticizers in latex materials and are often used in medical equipment such as IV infusion sets. Phthalates may leach off of such equipment and are suspected in the etiology of shock lung syndrome when injected intravenously.		
<u>1,1,2 - Trichloroethane</u>	Toxicity - Inhalation: Ingestion:	Narcotic, local irritant may (B - cause liver and kidney damage. Local irritant (in 1 ug/l concentrations) suspected to cause liver and kidney damage
Note: It may be a percutaneous hazard - when <u>hands are immersed in concentrated liquid (only)</u> .		
<u>1,2 - trans-Dichloroethylene</u>	Toxicity: Ingestion:	low toxicity except when exposed to concentrated vapor - nausea, vomiting, dizziness with immediate recovery upon removal from exposure. Ingestion of concentrated liquid - hausea, vomiting.
Note: 1,2 - DCE is a dermatitis producing agent. It is <u>not</u> percutaneous.		
<u>Vinyl Chloride:</u>		
Note: A <u>well-known</u> human carcinogen. 1979 ambient WQ criterion = 51 ug /l based on tumor-production in rats		

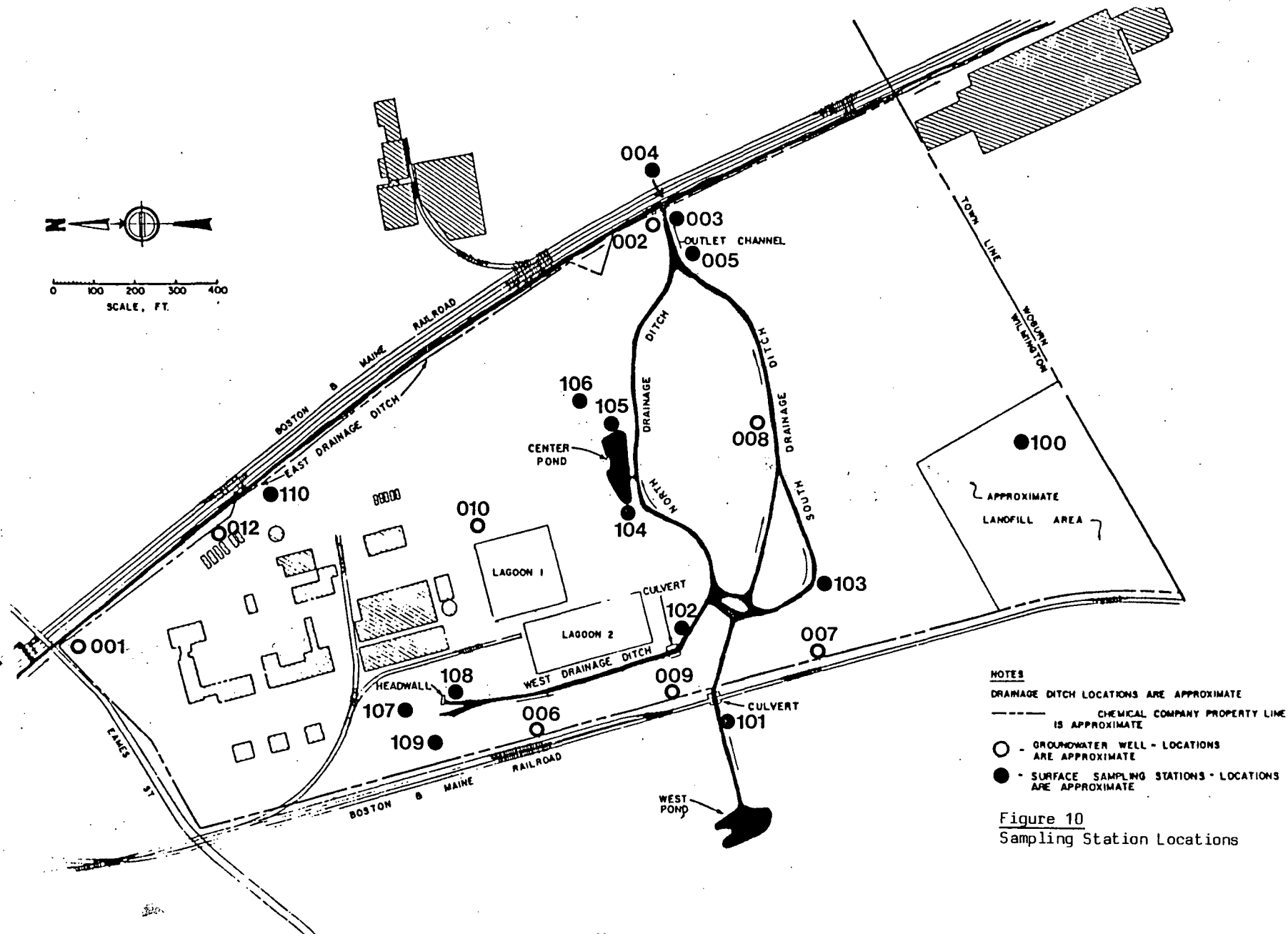
4. Concept of Operation - continued

The following instruments were used during the visit to delineate potentially hazardous areas and screen samples:

1. Century organic vapor analyzer (OVA)
2. Explosimeter
3. Oxygen meter

The site sampling plan was based upon existing knowledge of groundwater and surface water movement on Olin property. The groundwater contours presented on the overlay for Figure 10 are from a report entitled "Report on Groundwater and Surface Water Study - Stepan Chemical Company, Wilmington, Massachusetts" by Geotechnical Engineers, Inc. of Winchester, Massachusetts (1979). Both groundwater and surface water moves in a northwest to southeast direction. As a result, priority pollutant groundwater and surface water samples were taken near the southeast corner of the site. A priority pollutant groundwater sample was taken near the northwest corner of the site for background data. A total of eight groundwater, ten surface water and five soil samples were taken. The sampling locations are shown in Figure 10. See Section 7.2 of this report for detailed sampling procedures and preliminary screening results. Parameters for the monitoring wells on Olin property are presented in Table 2.

All samples were iced immediately and brought to the EPA Regional Laboratory in Lexington, Massachusetts, for further screening and analysis. Appropriate decontamination measures were followed prior to leaving the site. The safety plan and report are included in Appendix A.

**NOTES**

DRAINAGE DITCH LOCATIONS ARE APPROXIMATE

----- CHEMICAL COMPANY PROPERTY LINE IS APPROXIMATE

○ - GROUNDWATER WELL - LOCATIONS ARE APPROXIMATE

● - SURFACE SAMPLING STATIONS - LOCATIONS ARE APPROXIMATE

Figure 10
Sampling Station Locations

TABLE 3 - Parameters for Monitoring Wells on the Olin Property in
Wilmington, Massachusetts

<u>Well #</u>	<u>Depth of Well (ft.)</u>	<u>Water Table Depth (ft.)</u>	<u>Depth of Screened Section (ft.)</u>
GW - 1	21.2	9.0	14.0 - 19.5
GW - 2	15.0	7.5	9.5 - 14.5
GW - 3	22.0	4.2	10.0 - 15.0
GW - 4	13.5	2.5	8.0 - 13.0
GW - 5	12.0	0	5.0 - 10.0
GW - 6	18.0	4.0	8.2 - 13.2
GW - 7	14.0	2.6	8.5 - 13.5
GW - 8	10.2	1.5	3.2 - 8.2
GW -10	24.0	5.4	4.8 - 9.8
GW -11	17.0	3.9	9.0 - 14.0
GW -12	12.7	0	4.8 - 9.8

- All wells have inside diameters of 1.5".
- Location of wells is shown in Figure 2 of this report.
- All well parameters are from: Report on Groundwater and Surface Water Study - Stepan Chemical Company, Wilmington, Massachusetts: Geotechnical Engineers, Inc. Winchester, Massachusetts, December 6, 1978.

5. Logistics and Site Setup:

Because of the large area covered during this inspection and the large amount of sampling equipment required to accomplish the objective, it was necessary to move the van and associated decon several times. Figure 11 shows the various locations of the van during the inspection. Equipment decontamination was performed after each sampling effort, and appropriate equipment and personnel decontamination measures were performed following the final sampling at Well GW-2 (Station 012).

No hot line was delineated as no "hot spots" were indicated during the preliminary assessment or the site inspection.

No logistical problems were encountered during the planning and performance of this site inspection. A minor pumping problem was encountered during sampling at the first groundwater station (001). However, following appropriate adjustments, samples were successfully retrieved from depths up to ten feet with the portable hand pump. The portability of this sampling technique was very important at Station 008 which was nearly inaccessible due to dense vegetation and swampy ground.

6. Site entry team and Schedule of Events:

6.1 Site Entry Team and Team Assignments:

David Cook	-	Site Entry Team Leader
Paul Clay	-	Sampling Officer
Lori Fucarile	-	Safety Officer
Glenn Smart	-	Equipment/Work Party
Richard DiNitto	-	Work Party
Margret Hanley	-	Work Party
Bill Norman	-	Work Party

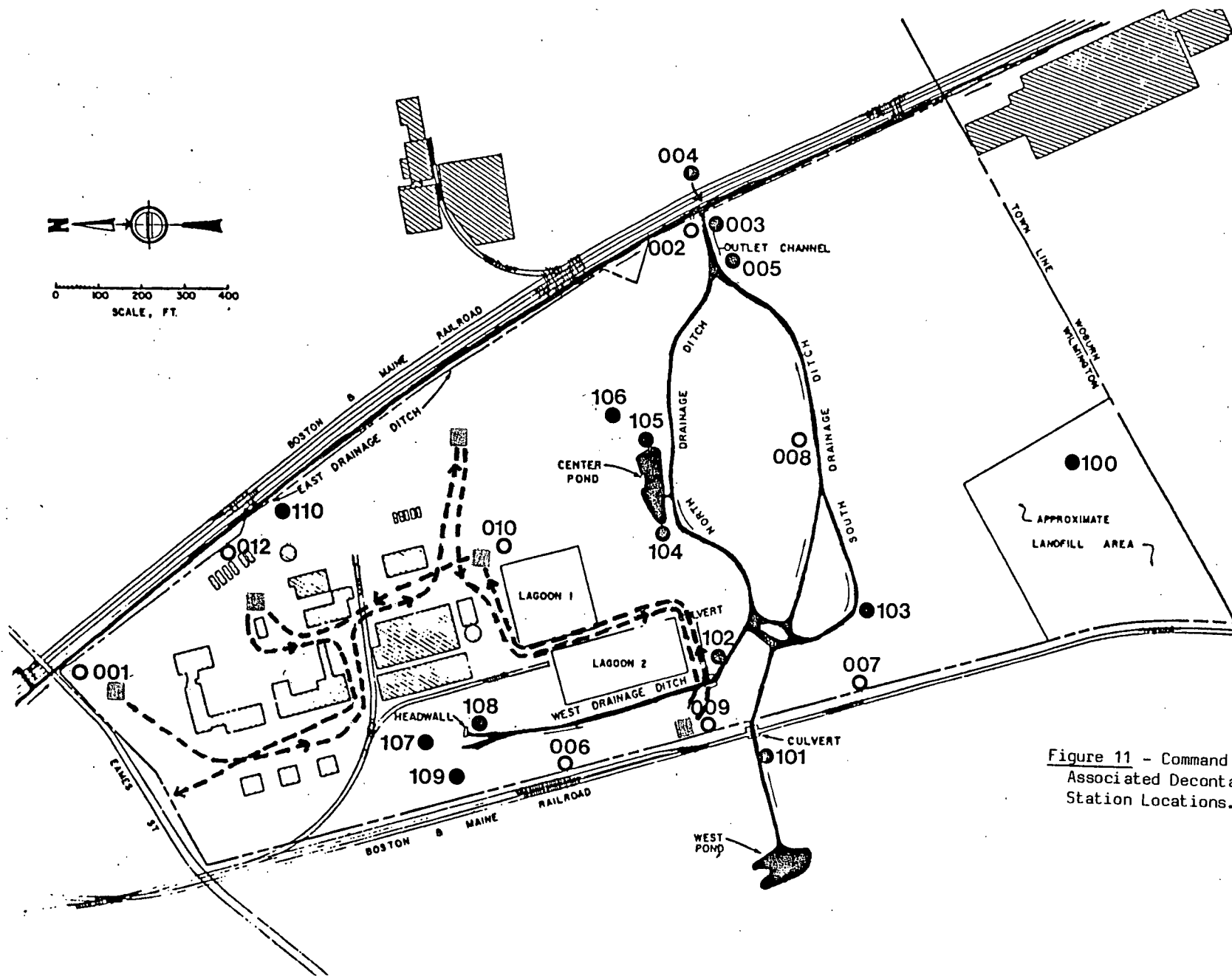


Figure 11 - Command Post and Associated Decontamination Station Locations.

6. Site Entry Team and Schedule of Events - continued

6.2 Schedule of Events

The site entry team was briefed by the team leader on November 11, 1980 (the day before site entry). The briefing included review of appropriate data obtained during the preliminary assessment for the purpose of making the team aware of all potential hazards. The briefing focused the team's attention on the questions raised by the preliminary site assessment.

In order to facilitate completion of sampling on November 12, 1980, the team was divided into two groups: Cook, DiNitto and Hanley (Team 1) collected the surface water and sediment samples and Fucarile, Clay, Smart and Norman (Team 2) collected the groundwater samples.

The following was the schedule of events for the site inspection.

0900 - Van arrives at Olin, team sets up decon and prepares sampling equipment. D. Cook meets with Olin representatives (Ted Groom and M. Ahsah of Olin Research Laboratory, David Vaughn, Environmental Coordinator and Ron McBrien, Plant Manager) and explains the objectives of the inspection. Split samples and duplicate photos are requested by McBrien and Vaughn.

0930 - Smart and Clay sample Well GW-1 (Station 001, Sample #70818).

1038 - Smart and Clay collect priority pollutant sample at Well GW-5 (Station 002, Sample #70809).

1040 - Cook collects priority pollutant sample of surface water at outlet of on-site drainage ditch (Station 003, Sample #70803).

6. Site Entry Team and Schedule of Events

6.2 Schedule of Events - continued

1100 - Clay samples culvert from E. C. Whitney (Station 004, Sample #70814).

1105 - Clay samples surface water from North Drainage Ditch (Station 005, Sample #70815).

1140 - Smart and Clay collect priority pollutant sample from Well GW-10 (Station 006, Sample #70816).

1200 - Team breaks for lunch and discusses sampling completed and still to be completed.

1315 - Team returns to site and divides into two groups described earlier (Teams 1 & 2).

Team 2:

1330 - Smart and Norman sample Well GW-12 (Station 007, Sample #70825).

1400 - Smart, Clay and Norman sample Well GW-8 (Station 008, Sample #70826).

1430 - Smart, Clay and Norman sample Well GW-11 (Station 009, Sample #70827).

1505 - Norman and Smart sample Well GW-6 (Station 010, Sample #70828).

1530 - Clay, Smart and Norman attempt to sample Well GW-7 (Station 011) but are foiled by a wasps' nest in the well.

1545 - Team 2 samples Well GW 2 (Station 012, Sample #70812).

6. Site Entry Team and Schedule of Events

6.2 Schedule of Events - continued

Team 1:

- 1330 - Sediment sample taken with auger at sulfate sludge landfill (Station 100, Sample #70824).
- 1345 - Sediment and surface water samples taken on Jewel Industrial Park property just west of culvert leading to Olin property (Station 101, Sample #70817).
- 1355 - Sediment and surface water samples taken at culvert just south of the Lagoon 2 (Station 102, Sample #70807).
- 1420 - Surface water sample taken approximately 75 feet east of Well GW-12 (Station 103, Sample #70821).
- 1440 - Surface water sample taken at west end of Central Pond (Station 104, Sample #70822).
- 1500 - Surface water sample taken at east end of Central Pond (Station 105, Sample #70823).
- 1515 - Sediment and surface water samples taken in area of dead trees (Station 106, Sample #99999).
- 1530 - Soil sample taken where Lake Poly was formerly located (Station 107, Sample #70808).
- 1540 - Surface water taken near headwell (Station 108, Sample #70810).
- 1550 - Evidence of buried drums (rusted bands lids and two partially buried drums) noted just west of headwall. Shallow soil sample collected (Station 109, Sample #9998).
- 1610 - Soil sample taken from area just south of tank farm (Station 110, Sample #99997).

6. Site Entry Team and Schedule of Events

6.2 Schedule of Events - continued

Team 1:

1615 - Teams 1 and 2 reunite at van and proceed to decon personnel and equipment. Chain of custody forms are completed and D. Vaughn of Olin signs for split samples transferred to him.

1640 - Site Inspection completed, team returns to office.

7. Results of Investigation

7.1 Site Representative Interview:

A detailed interview regarding the processes used on site was not necessary as this information was gathered during the preliminary assessment and is incorporated into Section 3.2 of this report. Mr. David Vaughn, Environmental Coordinator for Olin Chemicals Group, did confirm the presence of dioctylphthalate, diphenolamine, dioctylamine and other related chemicals in the "black ooze" seeping into the East Drainage Ditch. The seepage appears to be the result of a spill generating from the tank farm which took place during or prior to 1973. Presented in Appendix C is a letter from Charles P. Riley, Jr., General Manager of National Polychemicals to Thomas C. McMahon, Director of Massachusetts Water Resources Commission, dated July 18, 1973, describing the presence of "black ooze". Mr. Vaughn also confirmed the presence of contamination in Well GW-2 related to this spill and was hesitant to have us sample this well prior to undisclosed remedial action planned by Olin.

Mr. Vaughn expressed his desire to obtain duplicate samples and photographs associated with the site inspection.

7. Results of Investigation - continued

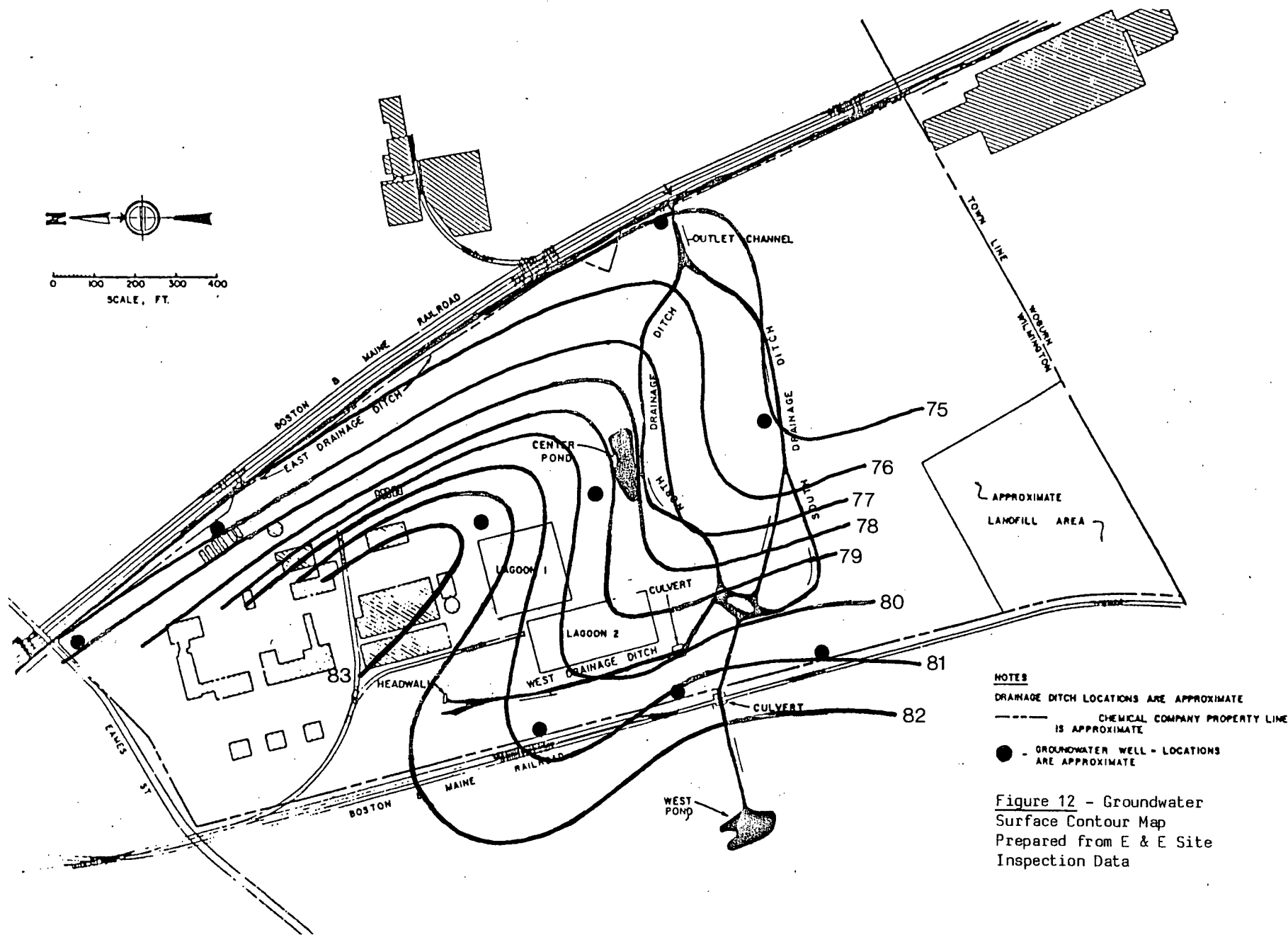
7.2 Sampling procedures and screening results:

7.2.1 Groundwater sampling procedures

The preparation for sampling the monitoring wells on the Olin property was the same in each case: (Note: All wells were capped and bolted. The bolts were sawed off to remove the well cap.)

First, the static level of water in the well was determined with a water level indicator. Second, the bottom of the well was sounded. Using these two measurements and the diameter of the well casing (1 1/2", in each case), the static volume of water in the well was calculated. Third, a hand operated vacuum pump attached to a sufficient length of Tygon tubing was used to discharge five times the static volume of the well. (This amount of discharge was not possible in some wells because of slow recharge and silted-in screens.) Following discharge, a volume of sample appropriate for the desired analytical parameters was collected by pumping. E & E personnel first filled their bottles and then filled bottles for Olin sampling personnel.

Between the sampling of each well, the sampling line and pump was cleaned by rinsing thoroughly, first with methanol and then with distilled water. The E & E sampling crew consisted of Paul Clay and Glenn Smart for wells GW-1, 5, and 10 and Paul Clay, Glenn Smart and William Norman for wells GW-12 8, 11, 6, 7, and 2. A groundwater elevation contour map prepared from data gathered during sampling is presented in Figure 12, which is very similar to Figure 10, the groundwater elevation contour map prepared by Geotechnical Engineers. The major difference is that surface of the the water table was generally 1 1/2 to 2 feet lower at the time of the E & E site inspection.

**NOTES**

DRAINAGE DITCH LOCATIONS ARE APPROXIMATE

--- CHEMICAL COMPANY PROPERTY LINE IS APPROXIMATE

● GROUNDWATER WELL - LOCATIONS ARE APPROXIMATE

Figure 12 - Groundwater Surface Contour Map
 Prepared from E & E Site Inspection Data

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.1 Groundwater sampling procedures - continued

The following is a summary of the sampling operations and data obtained at each well:

Olin Well GW-1 (Station 001, Sample #70818):

Depth of well: 21' 4"

Depth to water (static level): 11' 4"

Volume purged prior to sampling: 5 gallons

Samples taken: E & E obtained (1) 40 ml VOA vial with 10% head space for screening. Olin representatives obtained 80 ml.

Olin Well GW-5 (Station 002, Sample #70809):

Depth of well: 13' 2 1/2"

Depth to water (static level): 4' 1"

Volume purged prior to sampling: 5 gallons

Samples taken: E & E obtained the following priority pollutant sample:

(2) 1/2 gallon jars with Teflon lined caps for extractables

(2) 40 ml VOA vials for purgeables

(1) 1 liter polyethylene bottle for metals

(1) 40 ml VOA vial with headspace for screening

Olin representatives obtained similar volumes for similar analyses.

Olin Well GW-10 (Station 006, Sample #70816):

Depth of well: 12' 3"

Depth to water (Static level): 8'7"

Volume purged prior to sampling: 3 1/2 gallons

Samples taken: E & E obtained sufficient volume in appropriate containers for priority pollutant

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.1 Groundwater sampling procedures - continued

analyses (See description under Well GW-5).

Olin representatives obtained similar volumes for analyses.

Olin Well GW-12 (Station 007, Sample #70825):

Depth of well: 12' 1"

Depth to water (static level): 4' 7"

Volume purged prior to sampling: 3 1/2 gallons

Samples taken: E & E obtained (1) 40 ml VOA vial with 10% head space for screening. Olin representatives obtained 80 ml.

Note: Due to the fact that leaves and other debris were pumped as this well was purged, it is likely that the well casing is broken below the water table.

Olin Well GW-8 (Station 008, Sample #70826):

Depth of well: 10'10"

Depth to water (static level): 5'1"

Volume purged prior to sampling: 3 1/2 gallons

Samples taken: E & E obtained (1) 40 ml VOA vial with 10% headspace for screening. Olin representatives obtained 80 ml.

Note: Water had a brown, murky color throughout the purging and sampling processes.

Olin Well GW-11 (Station 009, Sample #70827):

Depth of well: 15' 9"

Depth to water (static level): 6'3"

Volume purged prior to sampling: 3 1/2 gallons

Samples taken: E & E obtained (1) ml VOA vial with 10% head space for screening. Olin representatives obtained 80 ml.

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.1 Groundwater sampling procedures - continued

Olin Well GW-6 (Station 010, Sample #70828):

Depth of well: 15' 1"

Depth to water (Static level): 5'11"

Volume purged prior to sampling: 3 1/2 gallons

Samples taken: E & E obtained (1) 40 ml VOA vial with 10% head space for screening. Olin representatives obtained 80 ml.

Olin Well GW-7 (Station 011, Sample #70811):

Depth of well: 16' 0"

Depth to water (static level): 5'4"

Volume purged prior to sampling: under two gallons

Samples taken: No samples taken.

Note: Well was clogged with wasps.

Olin Well GW-2 (Station 012, Sample #70812)

Depth of well: 16' 9"

Depth to water (static level): 12' 5"

Note: This well was highly contaminated with an oily substance, most likely dioctylphthalate.

Volume prior to sampling: Because of the depth of the well and the high viscosity of the contaminant, it was not possible to obtain more than a quart of material from this well. The intent was to take sufficient volume for a priority pollutant analysis. The volume obtained was split with Olin representatives. The sample was very obviously two-phase, with a top dark brown layer and a bottom aqueous layer.

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.2 Surface water and sediment sampling procedures:

With the exception of the priority pollutant surface water sample collected at Station 003, all sediment and surface water samples consisted of (1) 40 ml VOA vial with head space. All sediment samples were collected with a four-inch diameter soil auger. The locations of all sampling stations are shown in Figure 10.

Station 100 - Sample #70824

A sample from the sulfate sludge landfill was taken approximately one foot below the surface. The sample was greyish-white in color and had the consistency of wet clay.

Station 101 - Sample #70817

A mucky sediment sample was taken in the drainage channel approximately six inches below the channel bottom. A surface water sample was also collected at this station. The water was clear and colorless.

Station 102 - Sample #70807

A surface water sample was initially taken. Upon seeing a bubble of material breakout onto the water surface in a rainbow - colored sheen, it was decided to take a sediment sample. The sediment sample was taken approximately six inches below the channel bottom. It was black and impregnated with a thick black oily substance. A heavy rainbow-colored sheen covered the entire drainage channel as oily material seeped to the surface of the water from the hole made by the auger. Another surface water sample was subsequently taken. The water was clear and slightly brownish in color.

Station 103 - Sample #70821

A surface water sample was taken from a large puddle of standing water located in a depression resulting from recent (?) earth movement. The water was clear and colorless.

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.2 Surface water and sediment sampling procedures:

Station 104 - Sample #70822

A surface water sample was taken. The water was clear and colorless.

Station 105 - Sample #70823

A surface water sample was taken. The water was clear and colorless.

Station 106 - Sample #99999

A black mucky sediment sample was taken approximately six inches below the surface. The auger hole was allowed to recharge with water and a water sample was subsequently taken. The water was clear and colorless.

Station 107 - Sample #70808

A surface water sample was taken. The water was clear and colorless and was moving swiftly in the channel.

Station 108 - Sample #70810

A sandy, grey-colored, water soaked sediment sample was taken approximately four feet below the ground surface. Material above the sample location was light-tan, coarse grained sand.

Station 109 - Sample #99998

A black, mucky sediment sample was taken approximately six inches below the surface. The entire area where this sample was taken was resilient when jumped upon. The collected sample had the odor of fuel oil.

Station 110 - Sample #99997

A dark, fine-grained soil sample was collected approximately six inches below the ground surface.

7. Results of Investigation

7.2 Sampling procedures and screening results:

7.2.2 Surface water and sediment sampling procedures:

Station 003 - Sample #70803

A priority pollutant sample was taken of the surface water. There was a thin sheen on the surface of the water. The water was clear and colorless.

Station 004 - Sample #70814

A sample was taken of the standing water at the outlet of the culvert. The water which was clear and colorless was covered with the thick sheen.

Station 005 - Sample #70815

A sample was taken of the surface water. It was clear and colorless.

7.2.3 Screening results of surface water and groundwater samples

The samples specified below were screened on a Century Portable Gas Chromatograph using a T-12 column. All samples were shaken vigorously for two minutes and allowed to reach ambient temperature. 250 microliters (ul) of the headspace vapor were then withdrawn and injected directly into the detector to measure the total volatile hydrocarbon content. Those samples showing volatiles were then run again, but in the gas chromatograph mode. The results follow:

Olin Well GW-1 - Sample #70818

Large methane peak, followed by smaller, fast second peak - unidentified, possibly a higher alkane

Olin Well GW-5 - Sample #70809

Methane peak, no other volatiles within detection limit pH of sample = 6-8. Sample submitted for priority pollutant analysis.

Olin Well GW-10 - Sample #70816

Large methane peak, followed by smaller, fast second peak - unidentified, possibly a higher alkane. Sample submitted for priority pollutant analysis.

7. Results of Investigation

7.2 Sampling procedures and screening results - continued

7.2.3 Screening results of surface water and groundwater samples

Olin Well GW-12 - Sample #70825

No volatiles present within detection limits. pH of sample = 6-8.

Olin Well GW-8 - Sample #70826

No volatiles present within detection limits. pH of sample 4-6.

Olin Well GW-11 - Sample #70827

Large methane peak, followed by smaller, fast second peak - unidentified, possibly a higher alkane.

Olin Well GW-6 - Sample #70828

Methane peak, followed by small fast peak - unidentified, possibly a higher alkane.

Olin Well GW-7 - Not analyzed

No sample obtained

Olin Well GW-2 - Not analyzed

Olin has confirmed presence of dioctylphthalate in the well.

Olin/West End of Central Pond - Sample #70822

No volatiles within detection limits. pH = 6-8

Olin/Jewel Drive side of culvert - Sample #70817

No volatiles within detection limits. pH = 6-8

Olin/Channel near well #5 - Sample #70803

Methane, then very small second peak - not identified.
Sample submitted for priority pollutant analysis.

7. Results of Investigation

7.2 Sampling procedures and screening results - continued

7.2.3 Screening results of surface water and groundwater samples

Olin/Culvert southeast of sulfate lagoon - Sample #70807

Methane, then very small second peak - not identified.

Olin/East End of Central pond - Sample #70823

No volatiles present within detection limits. pH of sample 6-8.

Olin/Non Contact Cooling Water - west end of warehouse -

Sample #70810

Methane present.

Olin/North Drainage Ditch - Sample #70815

Methane present. No other volatiles within detection limit. pH = 6-8.

Olin Standing Water near Well GW-12 - Sample #70821

No volatiles present within detection limits. pH = 6-8

Olin/Surface Water near vegetative stress area - Sample #99999

No volatiles present within detection limits. pH = 6-8.

7.2.4 Screening results of soil and sediment samples.

An attempt will be made to analyze for the presence of volatile vapors in these samples by allowing the samples to reach room temperature and injecting a portion of the head space vapor into the portable GC. Since the column of the portable GC operates at ambient temperature, it is not practical to heat up the sediment samples to drive off vapor, as the vapor might condense in the column and thereby destroy the column.

7. Results of Investigation

7.2 Sampling procedures and screening results - continued

7.2.5 Photographs of Sampling Points

Figures 13 through 30 are photographs of the sampling locations.

8. Recommendations:

E & E has made arrangements with Olin to collect a priority pollutant sample at Well GW-2 to determine the extent of contamination. A pump capable of sampling this well is on order. With this exception, no additional on-site inspection or sampling activity of this site is warranted at this time. Should the priority pollutant analyses indicate unanticipated contamination, the need for re-entry will be evaluated.

The East Drainage Ditch should be examined regularly to determine if the absorbant pads now in place are preventing the entry of phthalates, amines and phenols into the ditch. There is an obvious need for remedial action to eliminate the ongoing contamination of a Class B stream (East Drainage Ditch) with priority pollutants including dioctylphthalate and possibly diphenyl hydrazine as well as various phenols and amines.

To avoid repeated spills of hazardous materials from the tank farm, it is recommended that an impervious base and confinement structure be provided.

The release of heavy fuel oil from oil impregnated soil into the North Drainage Ditch is taking place. The placing of absorbant pads at the entrance of this ditch into the East Drainage Ditch is recommended.

9. Conclusions:

The seepage from Olin property of at least one priority pollutant (dioctylphthalate) into a Class B stream is presently occurring.

This contamination is very likely entering the Aberjona River by way of Halls' Brook Storage Area.

A monitoring well located on Olin property is grossly contaminated with at least one priority pollutant.

There is extensive contamination of soil on Olin property with heavy residual oil.

A completed Potential Hazardous Waste Site - Site Inspection Report is included in Appendix B.



Figure 13: Sampling Station 001



Figure 14: Sampling Station 002

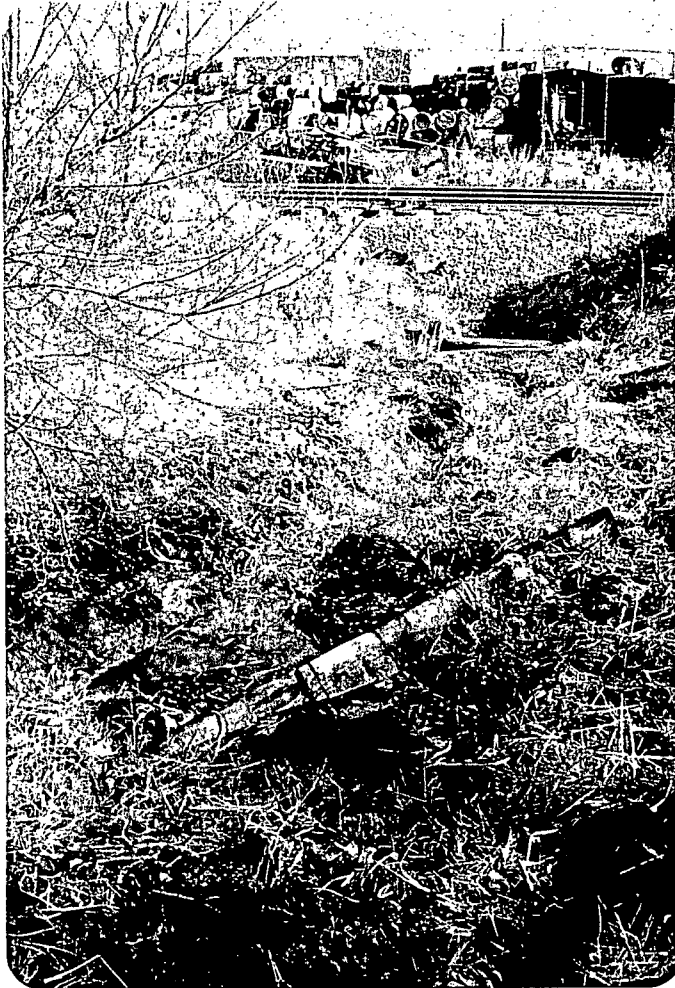


Figure 15: Sampling Station 003



Figure 16: Sampling Station 004



Figure 17: Sampling Station 005



Figure 18: Sampling Station 006



Figure 19: Sampling Station 007



Figure 20: Sampling Station 008

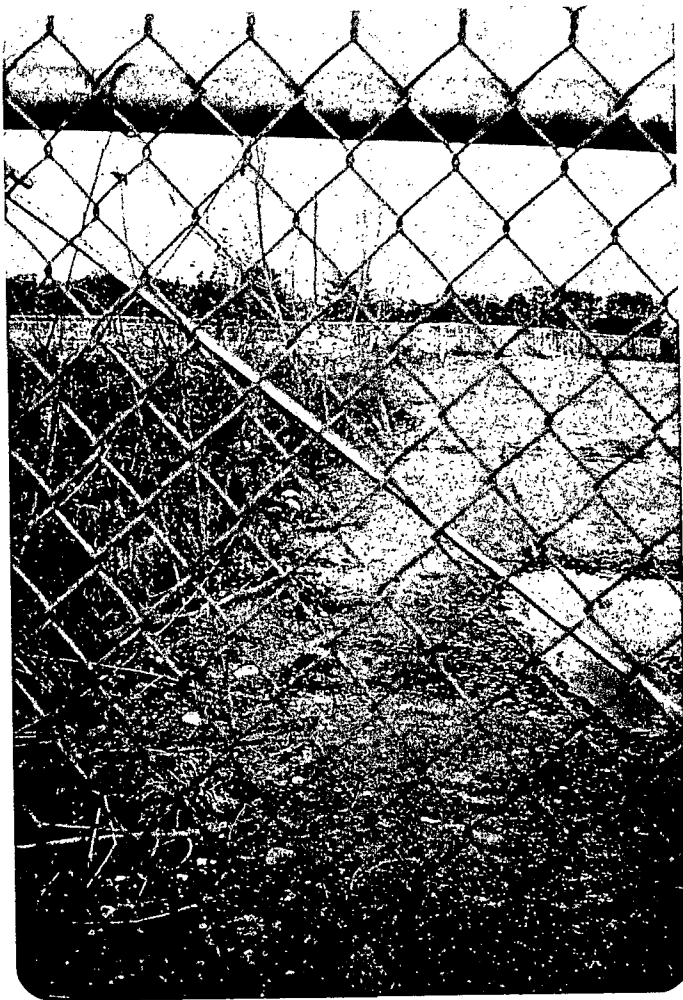


Figure 21: Sampling Station 009



Figure 22: Sampling Station 010

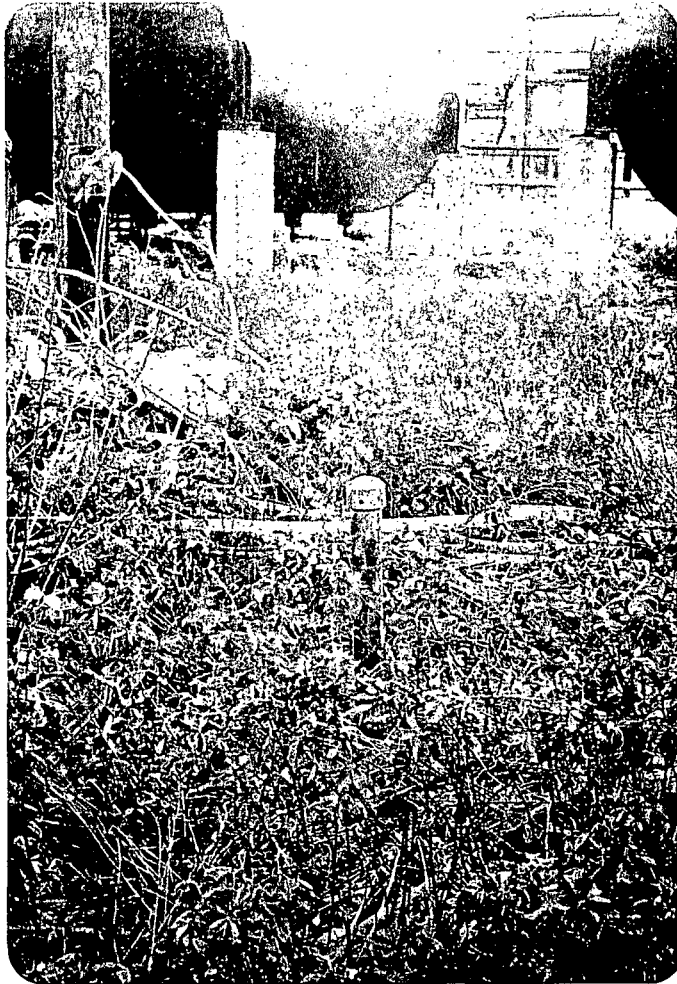


Figure 23: Sampling Station 012



Figure 24: Sampling Station 102



Figure 25: Sampling Station 103

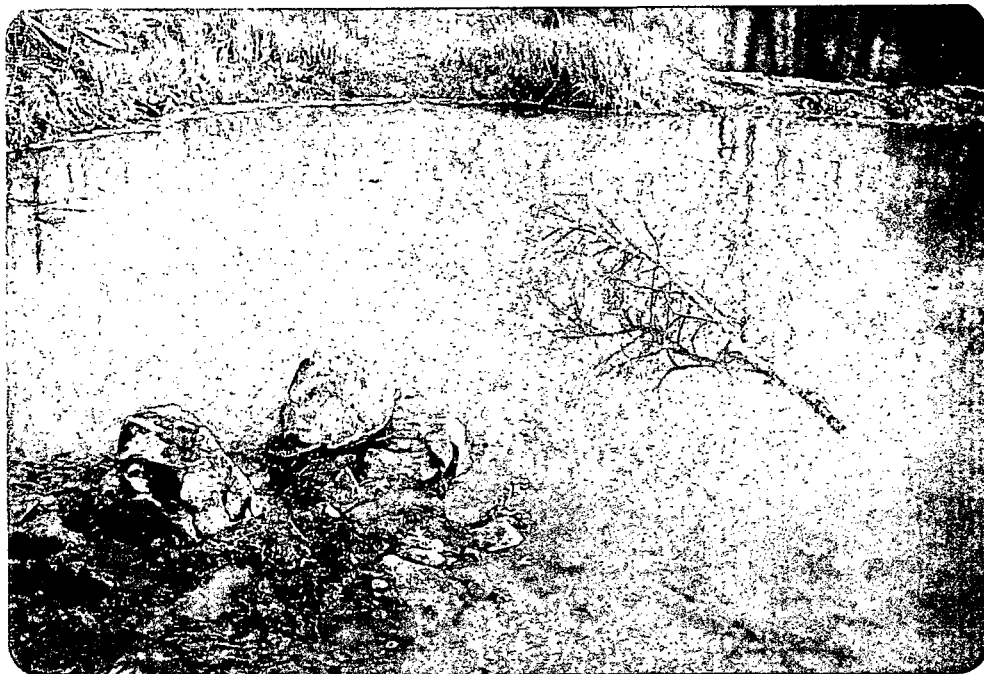


Figure 26: Sampling Station 104



Figure 27: Sampling Station 105



Figure 28: Sampling Station 106



Figure 29: View toward the northwest from Sampling Station 106

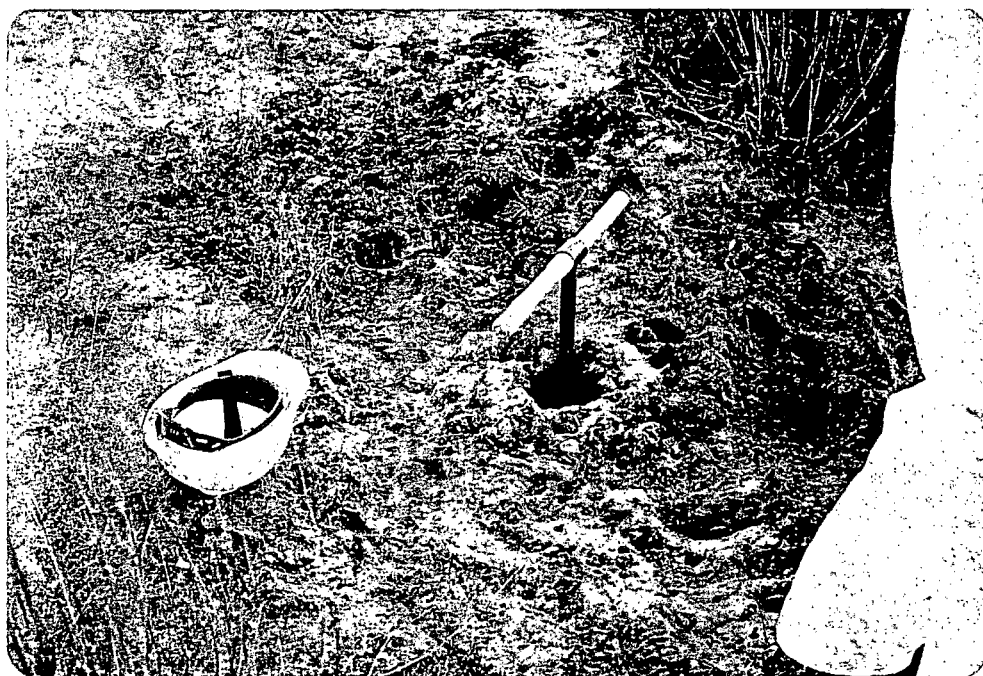


Figure 30: Sampling Station 108

APPENDIX A

SITE SAFETY PLAN

and

REPORT

SITE SAFETY PLAN

TE: Olin Chemicals Group Plant DATE: 10/23/80 TDD #: 1-8005-01
LOCATION: Eames Street, Wilmington, MA PREPARED BY: Fucarile/Desmarais
INVESTIGATIVE OBJECTIVE(S): To gather information necessary to determine the potential for RCRA
and/or 311/104 Clean Water Act action PROPOSED DATE OF INVESTIGATION: 11/5/80

BACKGROUND REVIEW: Complete: x Preliminary:
DOCUMENTATION/SUMMARY: OVERALL HAZARD: Serious Moderate x Low Unknown

SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Liquid x Solid x Sludge x Gas
CHARACTERISTIC(S): Corrosive x Ignitable Radioactive Volatile x Toxic React. Unk. Other
FACILITY DESCRIPTION: Size: 53 acres Buildings: approx. 7 buildings
11 storage tanks, 12 wells

Topography: embankment to ditch at RR tracks, marshland at back of property

Principal Disposal method (type and location): formerly three acid pits, now rectangular
settling basins used for gypsum containment, storage tanks

Unusual Features (dike integrity, power lines, terrain, etc.) bordered by B&M RR tracks
Status: (open, closed, unknown) open

INCIDENT HISTORY: (worker or non-worker injury; complaints from public; previous agency action):
Analysis of sludge Nat'l Polychemicals, Inc. 1970 leaching into Aberjona. Geotechnical
Engineers Study PVC liner leaks in 1979, Complaints to MDC regarding high chloride, sulfate
and ammonia levels in sewer. Former Stepan employee unofficially reported phosphorus trichloride
dumped on ground and residues buried near wetlands. He was taken to hospital for oxygen
because he was overcome by ammonia fumes inside building.

HAZARD EVALUATION

Moderate Hazard, After close examination of the Geotech. Study, Nat'l Polychemical Study etc.
The only priority pollutants presumed to be on site are toluene and dioctylphthalate. It is
highly likely that toluene would have volatilized soon after a spill. Dioctylphthalate is not
a vapor hazard. Toluene could be a vapor hazard if it is leaking. Ultra twins should be worn.
Also, could have acidic or basic leachates thus rubber gloves and boots and apron protection.
Eye protection taken care of by Ultra Twin masks. Other non priority pollutants which may
be on site could be ingestion hazards; therefore, reasonable hygiene should be practiced.

FIELD INVESTIGATION TEAM - REGION I

WORK PLAN INSTRUCTIONS

I. PERIMETER ESTABLISHMENT: Map/Sketch Attached x ^C Site Control _____
Public Perimeter Identified x Zone(s) of Contamination Identified x

NOTES:

^C areas of special safety concern identified

II. PERSONAL CLOTHING:

Level of Protection: A _____ B _____ C x D _____

Modifications: _____

Surveillance Equipment and Materials: TLD badges

DECONTAMINATION PROCEDURES:

Hot Line Location (initial): at public perimeter access

Command Post Location (initial): at public perimeter access

PDS Stations: 1. boot & glove wash 2. boot & glove rinse

3. _____ 4. _____ 5. _____

Equipment and Materials/Special Facilities: _____

SITE ENTRY PROCEDURES:

Team Size: E & E 5 State _____ Other _____

Entry Briefing (date) day before site entry

Station Designation (name/responsibility): 1. Dave Cook, Project Leader

2. Paul Clay, Equipment/Work party

3. Lori Fucarile, Safety

4. Robert Palermo, Work party

5. Paul Exner, Work party

6. _____

7. _____

Work Schedule/Limitations: _____

Site entry team will not be entering any buildings. Entry to (outside) area will be done only after receiving permission from Olin Chemical.

Notes: _____

ECOLOGY AND ENVIRONMENT, INC.
FIELD INVESTIGATION TEAM - REGION I

WORK PLAN INSTRUCTIONS - continued

EMERGENCY PRECAUTIONS:

ACUTE EXPOSURE SYMPTOMS

Volatile hydrocarbon exposure: lightheadedness, nausea

FIRST AID

Get to fresh air, administer
oxygen if required. Seek
medical aid

HOSPITALS/POISON CONTROL CENTERS (address, telephone number)

See Resources List

EMERGENCY TRANSPORTATION SYSTEMS (Fire, police, ambulance)

See Resources List

EMERGENCY ROUTES

Choate Hospital, Left from Olin gate onto Eames St. to Route 38, left on 38 (Main Street)
straight (Under 128) to Woburn Center approx 1.5 miles to Warren Ave. Choate Hospital is
at top of hill.

EQUIPMENT CHECKOUT

SCBA	_____	Cylinders	_____
Ultratwin	<u>x</u>	Cartridges	<u>x</u>
Explosimeter			<u>x</u>
O ₂ Indicator			<u>x</u>
Draeger Pump	<u>x</u>	Tubes	<u>x</u>
Radiation Survey Meter			_____
Radiation Contamination Meter			<u>x</u>

Eye Wash Unit	<u>x</u>
First Aid Kit	<u>x</u>
Drinking Water Supply	<u>x</u>
Personal Clothing	<u>x</u>
Decontamination Mat'ls.	<u>x</u>

ECOLOGY AND ENVIRONMENT, INC.
FIELD INVESTIGATION TEAM - REGION 1

SITE SAFETY PLAN SUMMARY

NAME OF SITE: Olin Chemical Group DATE: 10/23/80

TDD #: F-1-8005-01F

Location of site: Eames Street, Wilmington, MA

Directions to site: Washington Street North to West Street. Left on Industrial Way, right on Woburn Ave., then left on Eames Street.

Project Leader/Site Entry Leader: David Cook

Safety Person: Lori Fucarile

Equipment Person: Paul Clay

Work Party: Paul Clay, David Cook, Palermo, Paul Exner

Reason for Site Entry: to determine potential for RCRA/311/104 action

Special Hazards: Volatile hydrocarbons may be present; acid or base may be present

Hazard Assessment: (H, M, L, Unk.) Moderate, High levels of contaminants not expected

Level of Protection: Level C

Required Protective Equipment:

- | | |
|------------------------------------|--------------------------------|
| 1. <u>Ultra Twin w/cartridge</u> | 2. <u>Robert Shaw</u> |
| 3. <u>Tyveks (Chem. Resistant)</u> | 4. <u>Gloves</u> |
| 5. <u>boots</u> | 6. <u>hard hats</u> |
| 7. <u>TLD badges</u> | 8. <u>Butyl rubber aprons</u> |
| 9. <u>Explosimeter</u> | 10. <u>O₂ Meter</u> |

SITE: Olin Chemical Group PlantTDD #: F-1-8005-01FDATE: 10/23/80

RESOURCES
(locate resources on area map)

	<u>NAME</u>	<u>TOWN</u>	<u>PHONE</u>	<u>NOTIFIED YES/NO</u>
FIRE	Wilmington	Wilmington	658-3200	no
POLICE	Wilmington	Wilmington	658-3200	no
AMBULANCE	Wilmington	Wilmington	658-3200	no
HOSPITAL ER	Choate Hospital	Warren Ave., Woburn	933-6700	no
ATER SUPPLY	on van			
TELEPHONE	Olin Chemical	Eames St, Wilmington, MA	933-4240	yes
RADIO COMMUNICATIONS	NA			
AIRPORT	NA			
HELIPORT AREA	NA			
EXPLOSIVES UNIT	State Police	S. Lynnfield	593-1122	no
EPA CONTACT	Rick Leighton	Lexington/NERL	861-6700	yes

LIST OTHER RESOURCES:

EMERGENCY NUMBERS

E & E, Inc., Woburn	(617) 935-0228	(0238) (4008)
E & E, Inc. Arlington, VA	(703) 522-6065	24 hr. number - call forwarding
Dr. Harbison - Vanderbilt	(615) 322-4754	
Dr. Harbison - home	(615) 747-6353	24 hr. number - 9 second message
Robert Young - home	(617) 545-4905	
Anne Marie Desmarais - home	(617) 897-5306	
Peter Bent Brigham, Occup. Ind. Health Clinic:		
Dr. Speizer, Dr. Shenker, Kay Jordan	(617) 732-5983	
24 hour number - ask for bellboy 904	(617) 732-6000	

ECOLOGY AND ENVIRONMENT, INC.
FIELD INVESTIGATION TEAM - REGION 1

SITE SAFETY REPORT

NAME OF SITE: Olin Chemicals Group DATE OF ENTRY: 11/12/80
TDD #: F-1-8005-01F

Reason for Site Entry: To obtain information and samples for possible RCRA
and/or 311/104 Clean Water Act actions regarding Olin
Chemicals Group.

Personnel on Site:

Site Entry Leader: David Cook
Safety Person: Lori Fucarile
Equipment Person: Paul Clay
Work Party: Paul Clay, Glenn Smart, Margret Hanley, Richard DiNitto

Other E & E Personnel: _____

Other Personnel on Site: Ted Groom, M. Ahsah, and D. Vaughn (Olin Research)

Explain Any <u>YES</u> Answer on an Attached Sheet:	<u>YES</u>	<u>NO</u>
1. Was the Safety Plan followed as presented? Explain any and all deviations in full.	<u>X</u>	_____
2. Did any team member report chemical exposure?	_____	<u>X</u>
3. Did any team member report illness, discomfort, or unusual symptoms?	_____	<u>X</u>
4. Did any team member report environmental problems? (heat, cold, etc.)	_____	<u>X</u>
5. Did any team member report injury?	_____	<u>X</u>
6. Did the site entry have to be curtailed for <u>any</u> reason? (rain, lack of air, etc.)	_____	<u>X</u>
7. Were any emergency services or resources utilized?	_____	<u>X</u>
8. Were there any unusual occurrences?	_____	<u>X</u>
9. Was the Safety Plan adequate?	<u>X</u>	_____
10. What changes would you recommend? <u>None</u>	_____	_____

APPENDIX B

POTENTIAL HAZARDOUS WASTE SITE

SITE INSPECTION REPORT



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION I	SITE NUMBER (to be assigned by Hq)
-------------	------------------------------------

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME Olin Chemicals Group-Wilmington Plant		B. STREET (or other identifier) Eames Street	
C. CITY Wilmington	D. STATE MA	E. ZIP CODE 01887	F. COUNTY NAME Middlesex

G. SITE OPERATOR INFORMATION		2. TELEPHONE NUMBER	
1. NAME Mr. Ron McBrien (Plant Manager)		933-4240	
3. STREET Eames Street	4. CITY Wilmington	5. STATE MA	6. ZIP CODE 01887

H. REALTY OWNER INFORMATION (if different from operator of site)		2. TELEPHONE NUMBER	
1. NAME N/A			
3. CITY		4. STATE	5. ZIP CODE

I. SITE DESCRIPTION
Complex of Chemical Process Buildings on a large wooded lot

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.)	B. APPARENT SERIOUSNESS OF PROBLEM
	<input type="checkbox"/> 1. HIGH <input checked="" type="checkbox"/> 2. MEDIUM <input type="checkbox"/> 3. LOW <input type="checkbox"/> 4. NONE

C. PREPARER INFORMATION		
1. NAME David K. Cook	2. TELEPHONE NUMBER 935-4008	3. DATE (mo., day, & yr.) 12/4/80

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION	
1. NAME David K. Cook	2. TITLE Sr. Geological Engineer
3. ORGANIZATION Ecology and Environment, Inc. (E&E)	4. TELEPHONE NO. (area code & no.) 617-935-4008

B. INSPECTION PARTICIPANTS		
1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
David K. Cook	Ecology and Environment, Inc.	935-4008
Paul Clay	Ecology and Environment, Inc.	935-4008
Richard DiNitto	Ecology and Environment, Inc.	935-4008
Margret Hanley	Ecology and Environment, Inc.	935-4008
William Norman	Ecology and Environment, Inc.	935-4008
Glenn Smart	Ecology and Environment, Inc.	935-4008
Lori Fucarile	Ecology and Environment, Inc.	935-4008

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)		
1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
David Vaughn	Environmental Coordinator 203-356-3156	Hartford, CT
Ted Groom	Chemist 203-356-3156	Hartford, CT
M. Ahsah	Chemist 933-4240	Wilmington, MA

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Olin		Wilmington	Chemicals associated with rubber blowing agent manufacture

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
N/A			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
N/A		

G. DATE OF INSPECTION

(mo., day, & yr.)

11/12/80

H. TIME OF INSPECTION

0900-1630

I. ACCESS GAINED BY: (credentials must be shown in all cases)



1. PERMISSION



2. WARRANT

J. WEATHER (describe)

Clear/Cold

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER	X	Regional lab (2 priority)	1/10/81
b. SURFACE WATER	X	Regional lab (1 priority)	1/10/81
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL	X	Regional lab	1/10/81
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.).

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
Explosivity	Various	Consistently 0
O ₂ Meter	Various	Consistently 20
pH	All Well Samples	6-8

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS

☒ a. GROUND ☒ b. AERIAL

2. PHOTOS IN CUSTODY OF:

E&E

D. SITE MAPPED?

☒ YES. SPECIFY LOCATION OF MAPS: E&E

E. COORDINATES

1. LATITUDE (deg.-min.-sec.)

42° 31' 50"

2. LONGITUDE (deg.-min.-sec.)

71° 9' 30"

V. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)☐ 2. INACTIVE (Those sites which no longer receive wastes.)☐ 3. OTHER (specify):
(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

☐ 1. NO☒ 2. YES (specify generator's four-digit SIC Code): 2821

C. AREA OF SITE (in acres)

53

D. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO☒ 2. YES (specify): approx. 20 Process Buildings

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

<input checked="" type="checkbox"/> A. TRANSPORTER	<input checked="" type="checkbox"/> B. STORER	<input checked="" type="checkbox"/> C. TREATER	<input checked="" type="checkbox"/> D. DISPOSER
1. RAIL	1. PILE	1. FILTRATION	1. LANDFILL
2. SHIP	2. SURFACE IMPOUNDMENT	2. INCINERATION	2. LANDFARM
3. BARGE	3. DRUMS	3. VOLUME REDUCTION	3. OPEN DUMP
4. TRUCK	<input checked="" type="checkbox"/> 4. TANK, ABOVE GROUND	4. RECYCLING/RECOVERY	<input checked="" type="checkbox"/> 4. SURFACE IMPOUNDMENT
5. PIPELINE	5. TANK, BELOW GROUND	<input checked="" type="checkbox"/> 5. CHEM./PHYS./TREATMENT	5. MIDNIGHT DUMPING
6. OTHER (specify):	6. OTHER (specify):	6. BIOLOGICAL TREATMENT	6. INCINERATION
		7. WASTE OIL REPROCESSING	7. UNDERGROUND INJECTION
		8. SOLVENT RECOVERY	8. OTHER (specify):
		9. OTHER (specify):	Possible buried drums

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

☒ 1. STORAGE ☐ 2. INCINERATION ☐ 3. LANDFILL ☐ 4. SURFACE IMPOUNDMENT ☐ 5. DEEP WELL

☐ 6. CHEM/BIO/PHYS TREATMENT ☐ 7. LANDFARM ☐ 8. OPEN DUMP ☐ 9. TRANSPORTER ☐ 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

☒ 1. LIQUID ☐ 2. SOLID ☒ 3. SLUDGE ☐ 4. GAS

B. WASTE CHARACTERISTICS

☒ 1. CORROSIVE ☐ 2. IGNITABLE ☐ 3. RADIOACTIVE ☒ 4. HIGHLY VOLATILE

☒ 5. TOXIC ☐ 6. REACTIVE ☒ 7. INERT ☐ 8. FLAMMABLE

☐ 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes-inventories

vii. WASTE RELATED INFORMATION (continue.)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE		b. OIL		c. SOLVENTS		d. CHEMICALS		e. SOLIDS		f. OTHER	
AMOUNT		AMOUNT		AMOUNT		AMOUNT		AMOUNT		AMOUNT	
UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE	
<input checked="" type="checkbox"/> (1) PAINT, PIGMENTS		<input checked="" type="checkbox"/> (1) OILY WASTES		<input checked="" type="checkbox"/> (1) HALOGENATED SOLVENTS		<input checked="" type="checkbox"/> (1) ACIDS		<input checked="" type="checkbox"/> (1) FLYASH		<input checked="" type="checkbox"/> (1) LABORATORY, PHARMACEUT.	
(2) METALS SLUDGES		(2) OTHER(specify):		(2) NON-HALOGNTD. SOLVENTS		(2) PICKLING LIQUORS		(2) ASBESTOS		(2) HOSPITAL	
(3) POTW				(3) OTHER(specify):		(3) CAUSTICS		(3) MILLING/MINE TAILINGS		(3) RADIOACTIVE	
(4) ALUMINUM SLUDGE						(4) PESTICIDES		(4) FERROUS SMELTING WASTES		(4) MUNICIPAL	
(5) OTHER(specify):						(5) DYES/INKS		(5) NON-FERROUS SMLTG. WASTES		(5) OTHER(specify):	
						(6) CYANIDE		(6) OTHER(specify):			
						(7) PHENOLS	<input checked="" type="checkbox"/>				
						(8) HALOGENS					
						(9) PCB					
						(10) METALS					
						(11) OTHER(specify):					
						Phthalates					
						Amines					

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X')			3. TOXICITY (mark 'X')				4. CAS NUMBER	5. AMOUNT	6. UNIT
	a. SOLID	b. LIQ.	c. VA-POR	a. HIGH	b. MED.	c. LOW	d. NONE			
Diethylphthalate		X				X			15000	gal.
Diphenolamine		X			X				UNK	
Diethylamine		X			X				UNK	
Nonyl & DiNonyl Phenol		X			X				16700	gal.
Acids - Sulfuric		X		X					UNK	
Phosphorus Trichloride		X	X	X					UNK	

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

☒ A. HUMAN HEALTH HAZARDS

From phthalates & phenols in East Drainage Ditch

VIII. HAZARD DESCRIPTION (continued)

☒ B. NON-WORKER INJURY/EXPOSURE

See A

☐ C. WORKER INJURY/EXPOSURE☐ D. CONTAMINATION OF WATER SUPPLY☐ E. CONTAMINATION OF FOOD CHAIN☒ F. CONTAMINATION OF GROUND WATER

Phthalates & Phenols & amines in monitoring wells

☒ G. CONTAMINATION OF SURFACE WATER

Phthalates & Phenols & amines seeping into East Drainage Ditch

VIII. HAZARD DESCRIPTION (continued)

☒ H. DAMAGE TO FLORA/FAUNA

Large areas of dead trees on Olin property

☐ I. FISH KILL☐ J. CONTAMINATION OF AIR☐ K. NOTICEABLE ODORS☒ L. CONTAMINATION OF SOIL

Seepage of phthalates, amines & phenols into soil

☐ M. PROPERTY DAMAGE

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION☒ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

Leaking tanks caused the surface water and groundwater contamination

☐ P. SEWER, STORM DRAIN PROBLEMS☐ Q. EROSION PROBLEMS☐ R. INADEQUATE SECURITY☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION (continued)

☐ **T. MIDNIGHT DUMPING**

☐ **U. OTHER (specify):**

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	?	?	Aberjona Riv.	1 Mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	N/A			
3. IN PUBLICLY TRAVELLED AREAS	N/A			
4. PUBLIC USE AREAS (parks, schools, etc.)	?	?	Aberjona Riv.	1 Mile

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit) approx. 10	B. DIRECTION OF FLOW SE	C. GROUNDWATER USE IN VICINITY Industrial
D. POTENTIAL YIELD OF AQUIFER > 3 MGD	E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure) 5 miles	F. DIRECTION TO DRINKING WATER SUPPLY S
G. TYPE OF DRINKING WATER SUPPLY		
<input type="checkbox"/> 1. NON-COMMUNITY <15 CONNECTIONS* <input checked="" type="checkbox"/> 2. COMMUNITY (specify town): Woburn >15 CONNECTIONS <input type="checkbox"/> 3. SURFACE WATER <input checked="" type="checkbox"/> 4. WELL		

X. WATER AND HYDROLOGICAL DATA (continued)**H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE**

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COM- MUNITY (mark 'X')	5. COMMUN- ITY (mark 'X')
None				

I. RECEIVING WATER

1. NAME

☐ 2. SEWERS☒ 3. STREAMS/RIVERSAberjona River☐ 4. LAKES/RESERVOIRS☐ 5. OTHER (specify):**6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS**

Class B Stream being directly contaminated. Water unused

XI. SOIL AND VEGETATION DATA**LOCATION OF SITE IS IN:**☐ A. KNOWN FAULT ZONE☐ B. KARST ZONE☐ C. 100 YEAR FLOOD PLAIN☐ D. WETLAND☐ E. A REGULATED FLOODWAY☐ F. CRITICAL HABITAT☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER**XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED**

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
X		X			
X	1. SAND		Bedrock near surface		
X	2. CLAY		at southern end of site near landfill		
	3. GRAVEL				

XIII. SOIL PERMEABILITY☒ A. UNKNOWN☐ B. VERY HIGH (100,000 to 1000 cm/sec.)☐ C. HIGH (1000 to 10 cm/sec.)☐ D. MODERATE (10 to .1 cm/sec.)☐ E. LOW (.1 to .001 cm/sec.)☐ F. VERY LOW (.001 to .00001 cm/sec.)**G. RECHARGE AREA**☐ 1. YES☒ 2. NO

3. COMMENTS:

H. DISCHARGE AREA☒ 1. YES☐ 2. NO

3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

?

J. OTHER GEOLOGICAL DATA

XIV. PERMIT INFORMATION

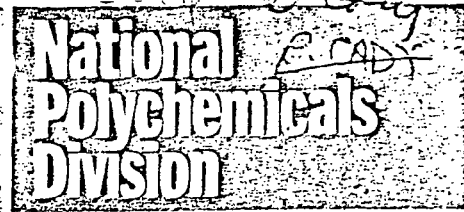
List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X')		
					1. YES	2. NO	3. UN- KNOWN
None							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS
☒ NONE ☐ YES (summarize in this space)

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition (Section II) information on the first page of this form.

STORAGE FACILITIES SITE INSPECTION REPORT <i>(Supplemental Report)</i>	INSTRUCTION Answer and Explain as Necessary.
1. STORAGE AREA HAS CONTINUOUS IMPERVIOUS BASE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
2. STORAGE AREA HAS A CONFINEMENT STRUCTURE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
3. EVIDENCE OF LEAKAGE/OVERFLOW (If "Yes", document where and how much runoff is overflowing or leaking from containment) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Small amount seeping into nearby drainage ditch. Monitoring well grossly contaminated	
4. ESTIMATE TYPE AND NUMBER OF BARRELS/CONTAINERS	
5. GLASS OR PLASTIC STORAGE CONTAINERS USED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
6. ESTIMATE NUMBER AND CAPACITY OF STORAGE TANKS 10 tanks, 6 in one group, 4 in another (5000 to 15000 gallon capacity)	
7. NOTE LABELING ON CONTAINERS None	
8. EVIDENCE OF LEAKAGE CORROSION OR BULGING OF BARRELS/CONTAINERS/STORAGE TANKS (If "Yes", document evidence. Describe location and extent of damage. Take PHOTOGRAPHS) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
9. DIRECT VENTING OF STORAGE TANKS <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
10. CONTAINERS HOLDING INCOMPATIBLE SUBSTANCES (If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
11. INCOMPATIBLE SUBSTANCES STORED IN CLOSE PROXIMITY (If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
12. ADEQUATE CONTAINER WASHING AND REUSE PRACTICES <input type="checkbox"/> YES <input type="checkbox"/> NO UNK	
13. ADEQUATE PRACTICES FOR DISPOSAL OF EMPTY STORAGE CONTAINERS <input type="checkbox"/> YES <input type="checkbox"/> NO N/A	



July 18, 1973.

Eames St., Wilmington, Massachusetts 01887

RECEIVED

Mr. Thomas C. McMahon, Director
The Commonwealth of Massachusetts
Water Resources Commission
Leverett Saltonstall Building
Government Center
100 Cambridge Street
Boston, Massachusetts 02202.

JUL 26 1973

MASS. DIVISION OF
WATER POLLUTION CONTROL

Dear Mr. McMahon:

The following is an item by item response to your letter of July 13, 1973.

- (1) The large volume of "industrial sludge" is pure calcium sulfate (gypsum) which had been lifted out of the secondary clarifier. This material has no odor and has not been eroded since being placed in its present position. It became necessary to remove this material from the pond because overflow conditions were being reached as the pond had filled at a much faster rate than had been anticipated due to a lower rate of compaction as the solids level increased. I am sure that your Division is aware of the fact that Dana Perkins has been engaged to engineer a second secondary clarifying pond and also a sanitary landfill for the gypsum on our property adjacent to the Woburn City dump. The engineering work on both of these projects has been progressing and Mr. Tarbell of Public Health and Mr. Romano, Wilmington Health Officer, have made a preliminary inspection of the proposed landfill area and of the secondary clarifier. It was pointed out at this time that erosion had not taken place even with very heavy rains. The general plans as developed by our consultant, Dana Perkins, entail the use of two secondary clarifier ponds with one area cleaned each year by removal of the gypsum to the approved landfill area. These plans will be submitted to your Division for review as soon as preliminary approval is obtained from Public Health.
- (2) The PVC liner in the lagoon has not been broken in two places. I can only assume that this comment refers to several channels from the lagoon that were created by the pond overflowing for a short period before the calcium sulfate was removed.
- (3) The wells referred to were experimental borings, placed under pumping tests by the D. L. Maher Company of North Reading. We were assured by Mr. Maher that he had the right to conduct flow tests on these wells without obtaining permits. This flow was discontinued on February 5, 1973 and will not be restarted.
- (4) The oil drums that receive the flow from the skimmer have been removed, the area cleaned and tight housekeeping will be maintained in the future.



The oil seepage which was directed to our attention by your inspectors was at the railroad ditch level about 10 - 15 feet below grade and behind our chemical storage tank farm. All tanks and lines were examined and found to be free from leakage. The soil behind the tankfarm at grade level is sandy and clean with no indications of chemical runoff. Our water pollution consultants from the Badger Corporation examined this site and have theorized that the seepage could be due to natural occurring hydrocarbons being leached from the soil at the extremely high water table that was experienced in May of this year.

We have recently examined the railroad ditch under the prevailing conditions of a much lower water table and there are now only very slight traces of oil films in the ditch. I am sure that your Division is aware that this ditch is loaded with raw sewerage emanating from above our plant site and that the bottom of the ditch exhibits concentrations of black sludge which appears to be raw sewerage derived.

At the present time, we are cooperating very closely with the Town of Wilmington, the MDC, and Public Health to eliminate all of our problem areas through approved long-term solutions. The Badger Corporation are consulting with us on the mechanics of the treatment plant with particular concentration in the area of finding more efficient sump pumps to handle our effluent streams. We have attempted to cooperate fully with your Division as evidenced by our conducting engineering personnel from other companies through our facility at Mr. Bonne's request and offering our engineering designs free of charge. However, on the inspection level, we feel that cooperation has been less than desirable. During the last inspection, your people refused my invitation to enter the office building and discuss with me their findings. They indicated to the plant people that they were "too busy" to do this. On another occasion one of your inspectors drove an automobile directly into our plant and through several hazardous operating areas to the treatment plant. I am sure that you are aware under the OSHA regulations that we are responsible for the safety of all persons who enter our plant areas and that all visitors must be equipped with the proper safety equipment at the front office.

The key personnel in this Division are ready to discuss our entire program and the individual points raised in your letter of July 13 at any time convenient to your personnel.

Very truly yours,

NATIONAL POLYCHEMICALS
A Division of Stepan Chemical Company

Charles P. Riley, Jr.
General Manager

CPR/jlp

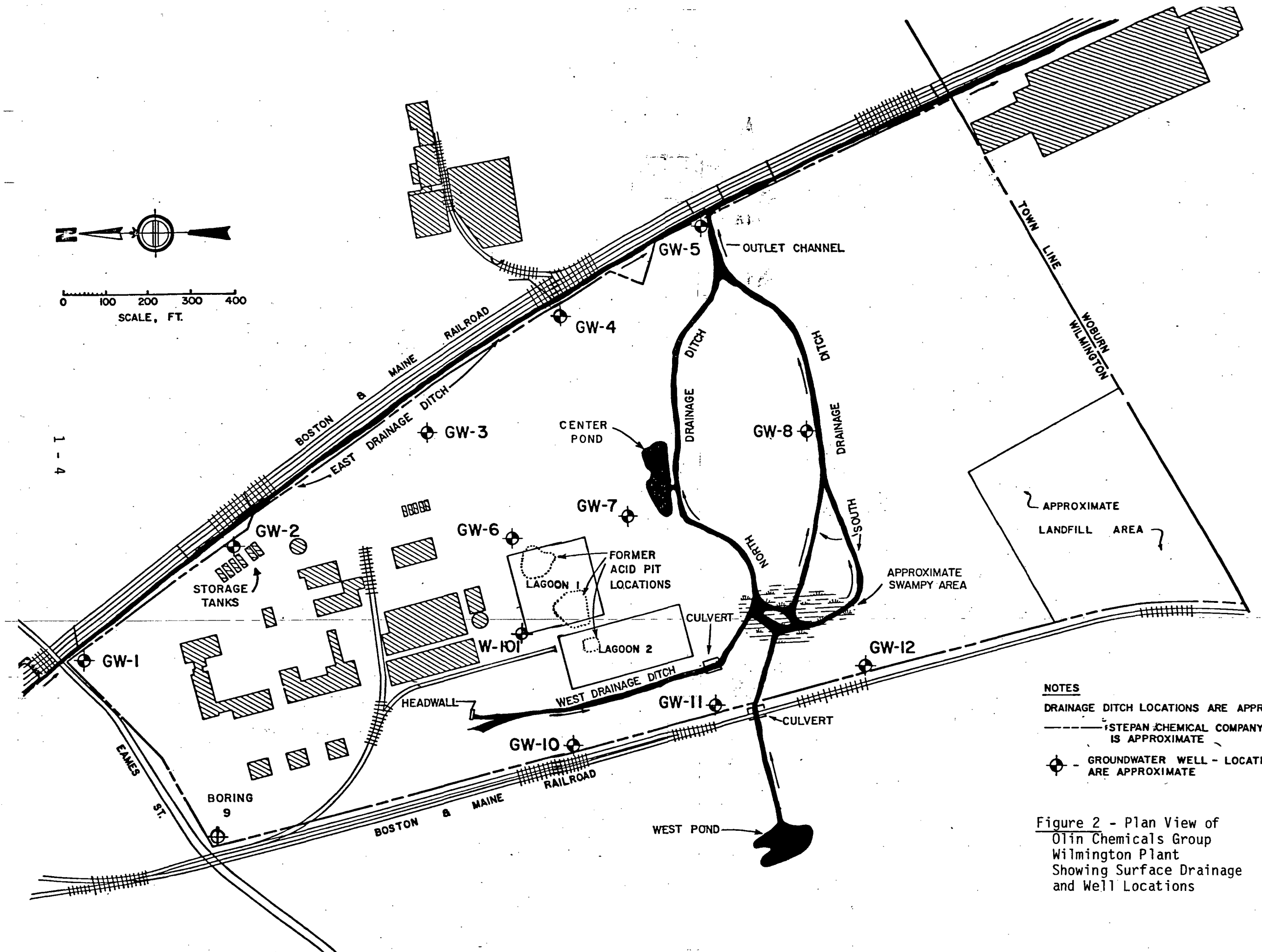


Figure 2 - Plan View of
Olin Chemicals Group
Wilmington Plant
Showing Surface Drainage
and Well Locations

- 1977
e Aerial Photograph
roperty in Wilmington

